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ABSTRACT

Playground safety in Australia has evolved from being an issue for parents, teachers, city engineers, and other generalists to an issue for specialists. This paper takes the position that the general community must become involved in playground planning, renovation, and maintenance. After presenting statistics on playground settings and playground accidents, the paper discusses playground safety assessment and approaches to preventing playground injuries for use by parents. These approaches include identifying the high points on equipment, identifying the fall zones, judging the softness of the surrounding surface, and taking measurements of the equipment to determine the proper size of bars and rails as well as potential strangulation hazards. Appended to the paper is "Every Parent's Guide to Assessing Playground Safety: Five Easy Steps for Spotting the Most Important Equipment-related Hazards." (BGC)

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Helping the Community to Understand Playground Safety

Ron Somers
South Australia

Playground safety has evolved in Australia from being an issue for interested parents, teachers, city engineers, restaurant operators and other generalists to an issue for specialists. The widespread availability of good injury case-data has allowed a detailed examination of all the varied injury-causing mechanisms that exist in the average playground. On the basis of these data new insights into preventive design have emerged. Now, all the technical sophistication of human factors analysis is being applied to the playground field. Suddenly the old players, the Mums and Pops of the game (who care the most about getting it right), are feeling left out.

It is important to again involve the general community in playground planning, renovation and maintenance. These are the people who *use* the playgrounds, and are therefore on most intimate terms with the safety status and general condition of the facilities. In many cases these are also the people who ultimately fund playground development, so they have a right to understand the safety implications of investment in alternative designs.

The problem is, as always, appropriate communication. Technical guidelines may in fact be counterproductive, leading to the conclusion that there is no place for lay involvement. What is required is clear presentation of the basic principles, and good examples of useful rules of thumb. The experts, including this author, have unwittingly created a monster of arcane calculations and exacting jargon, when a bit of plain talking would do. We can't make everyone a competent playground designer, but every interested party can play an important role in spotting hazards and choosing the best quality solutions.

Some Statistics from South Australia, 1994 -- mid-1996

In recent years playground equipment has continued to present a significant injury hazard to children in South Australia. There is some evidence to suggest that the progressive application of cushioning surfaces (ie, woodchip and other materials) has reduced the risk of brain injury, but many playgrounds still feature surfaces which are not soft enough to be protective.

It is estimated that 1,300 South Australian children each year require hospital treatment for injuries sustained from a fall off playground equipment. Indeed falls are the most important mechanism of injury from playground equipment, as is evident from the following table:

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type of playground equipment	percentage of accidents on this type of equipment *due to a fall*
slide	79%
seesaw	80%
monkey bar	94%
flying fox	91%
swing	73%

Of all children requiring hospital treatment for playground injuries, 19% sustained a head injury. Included in this group were 5.3% who sustained a brain injury. Fractures were also common amongst the victims of playground injury.

Children typically spend only a tiny fraction of their total play time on playground equipment, but a significant proportion of their reported injuries occur on such equipment. In the age group 4-12 years, for example, over 15% of *all* hospital-reported injuries occurred on playground equipment. The implication of these statistics is that time spent on playground equipment is high-risk time indeed. There is therefore a strong motivation to make playgrounds, and particularly playground surfaces, as safe as possible.

Playgrounds are found in a variety of settings in South Australia. The contribution of playgrounds in each setting to the overall phenomenon of playground injury is shown in the table below. It is important to remember that the observed frequency of accidents is a reflection of the number of playgrounds in each setting, the intensity of playground use in that setting, the level of supervision, and, of course, the actual safety status of the playgrounds.

type of playground setting	percentage of all playground accidents
HOME	18%
DAY-CARE SETTING	4%
SCHOOL	41%
COUNCIL PARK	23%
RESTAURANT	3%
OTHER PLAYGROUND LOCATION	11%

Using figures supplied by the Department of Education and Children's Services on the number of children attending public and private primary schools in South Australia, it was possible to estimate that approximately **44 per 10,000** children require hospital attention each year for injury sustained on *school* playground equipment alone. By way of rough comparison, it was calculated that approximately **45 per 10,000** children require hospital attention each year for injury sustained in a road accident. Of course playground-equipment accidents do not cause as many deaths as road accidents, but they do cause more cases of non-fatal injury.

Approaches to playground-injury prevention

The picture of playground injury painted above is not a particularly pretty one. And this is the experience in a state generally acknowledged to have made good progress over the past ten years! The statistics from some other states and territories are likely to be even more unsettling. Still, we *do* know what to do about the problem; it's simply a matter of applying some proven techniques.

It would be comforting to believe that merely identifying playground injury as a public health concern would be sufficient to bring down the injury rates. Unfortunately, neither awareness nor acknowledgment of the problem *per se* have proved sufficient to make a difference in safety outcomes; something more is required.

The essential factor contributing to safer outcomes is *change*. Whatever has been accomplished over recent years to reduce the occurrence of playground injury, and indeed much *has* been accomplished, it has been the result of some definable change. Ultimately, a decision maker (eg school principal, city engineer, etc.) on behalf of the community, or individual people on their own behalf, had to determine that the "pain" inherent in making a change was outweighed by the long-term benefits expected.

The pain of change involves extra effort, extra money, extra planning, extra consensus building, extra understanding, extra research, extra consultation, etc. Some people prefer to oppose change rather than endure the pain of it. These people often argue that:

- careless children get what they deserve
- playground hazards are best managed by insisting that children (and their supervisors) take better care
- injury prevention is a family or personal issue in which the community has no interest
- the economy is the only real problem affecting community well being
- investment in injury prevention is too expensive

Careful presentation of the facts and the principles of prevention is required to overturn these common myths and prejudices. Perhaps the most important principle to emerge in the last decade is that playground hazards are mainly *physical*, and as such they require physical solutions. This has led to the emphasis on cushioning surfaces, ergonomic hand holds, non-entrapping gaps and spaces, climb-resistant railings, safer equipment positioning, and a reduction in the former dependence on height alone to supply play value.

The focus on physical measures to control playground injury, in contrast to mere behavioural measures, has led to the emergence of a newly prized skill: **risk assessment**. It is the purpose of the verbal presentation to demonstrate the feasibility of teaching this skill to parents and others in the community who have an interest.

I know that you've already made significant progress, but clearly we all have miles to go before we can close the book on playgrounds as a safety priority. After ten years struggling to understand this issue, I would still characterise playgrounds as a puppy caught in a screen door. I'm sure that you can visualise **the picture:**

> child and puppy playing in the yard. child tires and enters the house, leaving puppy, who wants to continue the fun. puppy dashes through the gap of the closing door, making it halfway in before wedging tight between the door and the frame. try as it might the puppy simply cannot paw its way forward. the more it tries, the tighter it wedges.

Like the puppy, playground safety in Australia is caught in the transition between where we've been and where we want to go. Despite our good intentions and strong motivation, and despite that fact that we are half-way there, we can't seem to get our backsides all the way through the door.

Like the stuck puppy, we are so eager to go forward that we have overlooked the necessity of taking a step **back** first, in order to release what is hindering us.

Perhaps our eagerness for forward motion is understandable and forgivable at this particular juncture. We can be justly proud of our playground accomplishments over the past decade. Australia today finds herself with:

1. an in-tune manufacturing industry

2. community-service groups willing to consult with professional designers before rushing in to provide play facilities

3. schools and local governments well aware of their duty of care

4. state health departments clearly capable of documenting the consequences of playground accidents

5. national standards for playground design, most recently an excellent standard for "soft-fall" surfaces

6. a judiciary quite willing to discriminate between good- and poor-quality playgrounds in cases of compensation for injury

7. a network of knowledgeable and reputable private design consultants

8. an industry-wide acknowledgment that the best playgrounds feature more play opportunity than just "equipment"

9. a greater understanding than ever before of the need to match playground design to the developmental stage, level of supervision, and play needs of the intended user age-group

And yet, despite all these things that we have worked so hard to achieve, we are still plagued by out-moded, poorly conceived, sub-standard, and decaying playgrounds, all of which pose a significant threat of injury. In my own state, where playground progress has been amongst the best in the country, I have recently calculated that **school playgrounds** *alone* send as many children to hospital each year as road accidents. And this doesn't count the victims from council playgrounds, restaurant playgrounds, home play equipment, etc.

Clearly we have missed something important in our overall strategy, and *my* bet is that we have neglected to fully utilised **the public** as advocates of safer playgrounds.

There is no pressure like the political pressure which can be generated by members of the public who are roused to a good cause. The last few years in South Australia have seen the formation of lobby groups consisting of residents concerned about safer conditions for pedestrians. One such group is called **Walk Safe.** Well, how about **Play Safe** as a concept? I can see no reason why parents in the community cannot band together to make known their dissatisfactions with local playgrounds. It is up to us in the industry to educate and motivate parents and other interested adults to get involved.

This strategy presupposes that ordinary people can grasp the fundamentals of safe playground design in order to identify hazardous situations. Playground safety is a very technical discipline indeed. It is simply not reasonable to expect lay people to master the arcane jargon of the Australian playground standards. Like most standards, these documents are really intended for manufacturers and other playground professionals.

So how can we communicate to the ordinary parent the essential elements of playground assessment? I have come up with a few examples which may inspire your own ideas on the subject. The trick, I believe, is to distil a few key issues down to their essence, without worrying too much about being 100% technically correct. As in other areas of life, it is the last 5% of playground matters which require most of the explanation. Let's agree from the outset that we will simply concentrate on the other 95%, which is rather easily understood. In my experience, it is counterproductive to be a purist or to insist on a totally comprehensive approach.

The first concept that can be easily understood is that HEIGHT = DANGER. Parents always seem to assume, for example, that the bottom of the slide is the danger point, whereas in fact the top, being so much higher, is the greater potential danger. Most serious playground injury results from a fall. I believe that parents can identify the most likely sites of potential fall in any playground, once they are given the hint about looking for the high points.

Having identified the falls most in need of prevention, it is easy to pick the **landing zones** which require softening for safety. Simply stated, the safe fall zone should extend outward from the equipment a distance equal to the height of the potential fall.

How soft is soft enough? Here again we need a simplifying concept. I suggest that we instruct parents to use their knees to judge softness. A surface is sufficiently soft if a parent is willing to drop onto the surface suddenly, from a standing position onto their knees. If the parent senses that this would be disastrous, chances are that the surface is too hard to prevent a fall injury. If loose-fill material is already present, the solution might be as simple as raking in a deeper layer of the same material.

One good way to prevent falls from happening in the first place is to ensure that children have a proper rail, bar, cable or chain to hold on to whenever they are at a height or subject to equipment motion. Technically the playground standard calls for diameters between 19 and 38mm, but it's simple enough to use the round top off a plastic drink bottle (top diameter 30mm) to judge that the grip size is reasonable for little hands.

After falls, the next most dangerous hazard of playground equipment is head entrapment, which can lead to strangulation. Any gap or opening situated 600mm (ie mid-thigh height on an average adult) above a standing surface should be either too small to insert a child's head (ie less than 125mm in diameter) or too big to entrap a child's head (ie more than 230mm in diameter).

These critical dimensions can be easily represented with two types of common soft drink containers, the 1.25 litre plastic bottle, and the 375ml aluminium can. To achieve the required larger dimension, cut the short neck off the plastic bottle. The rule is that a gap is ***unsafe*** if it allows the can to pass through in any orientation but does ***not*** allow the bottle to pass through in any orientation.

With a simple black and white instruction sheet all parents could inspect local playgrounds with sufficient confidence to report back any questionable designs that they have encountered. All they need is a channel of communication that is open and reassuring. Herein lies the basis of our strategy.

It is up to us, the "facilitators" of the process, to assist in the creation of competent playground activists. It's probably best to build local coalitions and consortia from existing groupings of parents, be they associated with a kindy, primary school, scout group, church, street association, service club or whatever.

Many playground safety promoters have burnt themselves out in the past decade because they tried to shoulder the main political burden themselves. I am suggesting that it is time to re-think this strategy, and to abandon it in favour of an alternative. Like the puppy in the door, there is no way that we can power ourselves forward. We are stuck, and we need to back off and find a new approach. It's time to harness the political energy of the community more effectively than we have previously.

4

Take a break.

Relax with a couple of soft drinks.

To complete this exercise you will need:

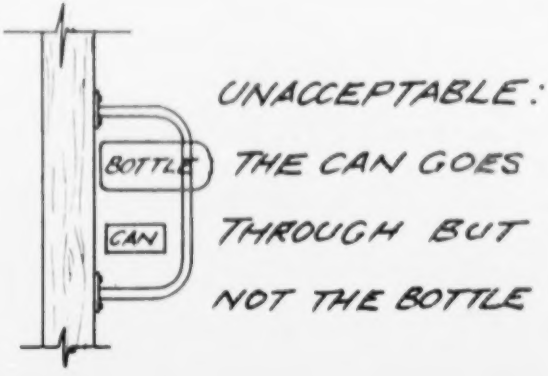
- ***one*** aluminium soft-drink can (standard 375ml size, any flavour);
- ***one*** 1.25 litre plastic soft-drink bottle.

5

Use your can, your bottle, and the bottle cap, to take some rough measurements.

All the equipment rails and bars (and cables and chains) should be about the same diameter as the bottle cap. Children can't grasp large timbers.

All the gaps and spaces which accept the can (in any orientation) should also accept the bottle (in any orientation). If you can get the can through, *but not the bottle*, you have found a potential strangulation point!



Every Parent's Guide to

Assessing

PLAYGROUND SAFETY

FIVE EASY STEPS
FOR SPOTTING THE MOST IMPORTANT EQUIPMENT-RELATED HAZARDS

Sponsoring Organisations:

1

Height = Danger

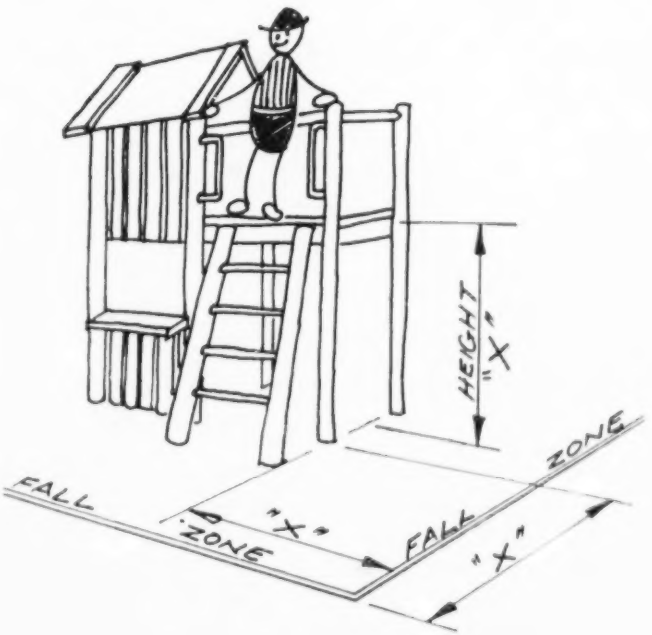
Stand back from the playground and note all the ***highest*** pieces of play equipment.

Determine how high a child might be able to climb on each play item.

The high points are the ***danger points***.

2

For each danger point, estimate the fall zone.



The fall zone extends outward a distance no less than the height of the fall.

3

For each fall zone, judge the softness of the surface.

Stand with legs straight in the fall zone at the location of the most likely crash landing.

Are you prepared to drop suddenly to your knees (as on a trampoline)? Or do you think you might hurt yourself?

If you think you might hurt yourself, then the surface is probably not soft enough to prevent serious injury.

As a rule of thumb, there should be around 20cm of wood chip or some other soft material beneath a fall of one meter.

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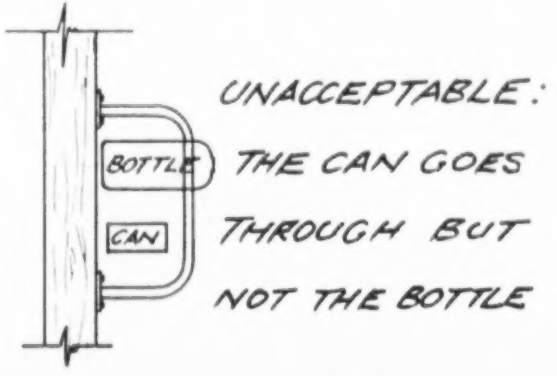

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